Chapter Seven Practice Test #2
Trigonometry

Best Wishes to Key

1. Determine whether ΔLMN is a right triangle given the following vertices: $A(-1, 1)$, $B(-2, 2)$, $C(3, 5)$. Explain your answer by showing your work.

$AB = \sqrt{(-2-1)^2+(2-1)^2} = \sqrt{1+1} = \sqrt{2}$

$BC = \sqrt{(3-2)^2+(5-2)^2} = \sqrt{25+9} = \sqrt{34}$

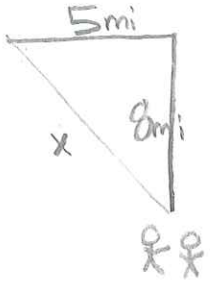
$AC = \sqrt{(3-1)^2+(5-1)^2} = \sqrt{16+16} = \sqrt{32}$

$\sqrt{2}^2 + \sqrt{32}^2 = \sqrt{34}^2$

$2+32 = 34$

$34 = 34\checkmark$ Yes

2. Two joggers run 8 miles north and then 5 miles west. What is the shortest distance, to the nearest tenth of a mile, they must travel to return to their starting point?



$5^2 + 8^2 = x^2$

$25 + 64 = x^2$

$89 = x^2$

$x \approx 9.4$ mi

Determine whether each set of measures are the sides of a right triangle. Then state whether they form a Pythagorean triple.

3. $\frac{3}{4}$, 1, $\frac{5}{4}$

$\frac{3}{4}^2 + 1^2 = \frac{5}{4}^2$

$\frac{9}{16} + 1 = \frac{25}{16}$

$\frac{25}{16} = \frac{25}{16}$

Yes - R+Δ
NO - PT

4. 7, 17, 24

$7^2 + 17^2 = 24^2$

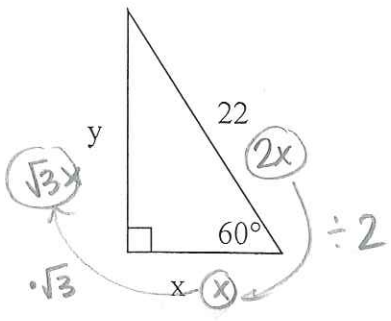
$49 + 289 = 576$

$338 \neq 576$

NO - R+Δ
NO - PT

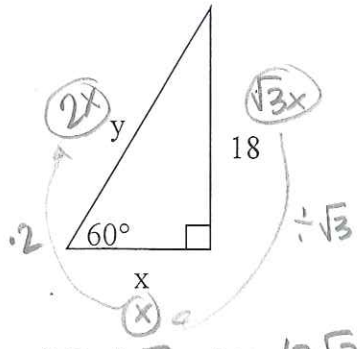
For problems 7-10, write your answers as <u>simplified radicals</u>.

5.



x = 11 y = $11\sqrt{3}$

6.



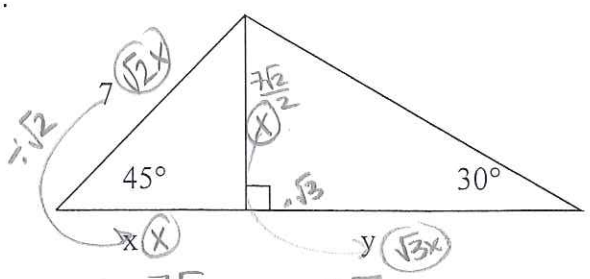
$\frac{18}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}}$

$\frac{18\sqrt{3}}{3} = 6\sqrt{3}$

x = $6\sqrt{3}$ y = $12\sqrt{3}$

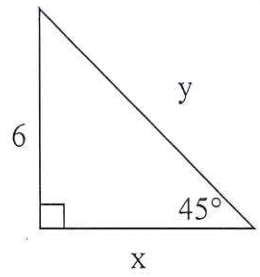
$\frac{7}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{7\sqrt{2}}{2} \cdot \frac{\sqrt{3}}{1} = \frac{7\sqrt{6}}{2}$

7.



$x = \frac{7\sqrt{2}}{2}$ $y = \frac{7\sqrt{6}}{2}$

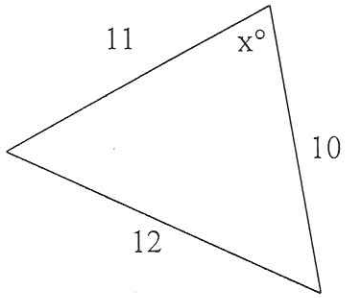
8.



$x = 6$ $y = 6\sqrt{2}$

Find the missing measurements using Pythagorean Theorem, Trigonometric Ratios, Law of Sines or Law of Cosines. Round to the nearest <u>tenth</u>.

9.



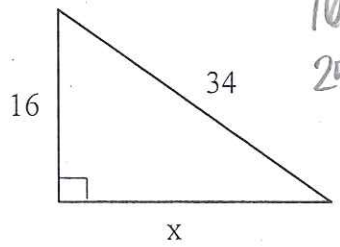
$12^2 = 11^2 + 10^2 - 2(11)(10)\cos x$

$144 = 221 - 220\cos x$

$-77 = -220\cos x$

$x \approx 69.5°$

10.



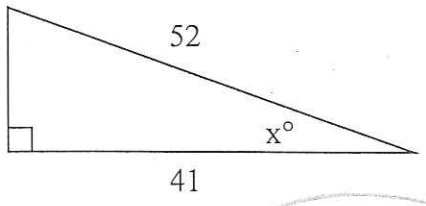
$16^2 + x^2 = 34^2$

$256 + x^2 = 1156$

$x^2 = 900$

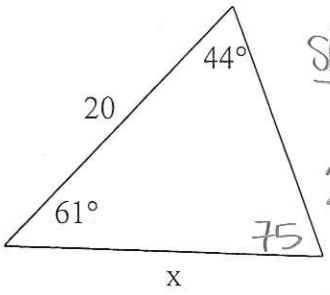
$x = 30$

11.



$\cos x = \frac{41}{52}$ $x \approx 38.0°$

12.

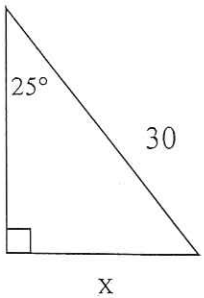


$\frac{\sin 75}{20} = \frac{\sin 44}{x}$

$\frac{20\sin 44}{\sin 75} = \frac{x\sin 75}{\sin 75}$

$14.4 \approx x$

13.

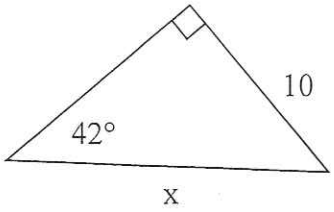


$\sin 25 = \frac{x}{30}$

$30\sin 25 = x$

$12.7 \approx x$

14.

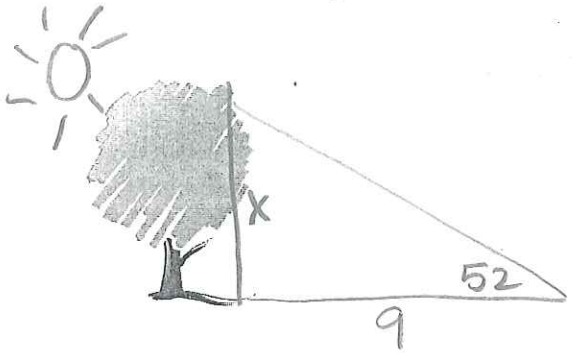


$\sin 42 = \frac{10}{x}$

$\frac{x\sin 42}{\sin 42} = \frac{10}{\sin 42}$

$x \approx 14.9$

15. When the angle of elevation to the sun is 52°, a tree casts a shadow that is 9 meters long. What is the height of the tree? Round to the nearest tenth.



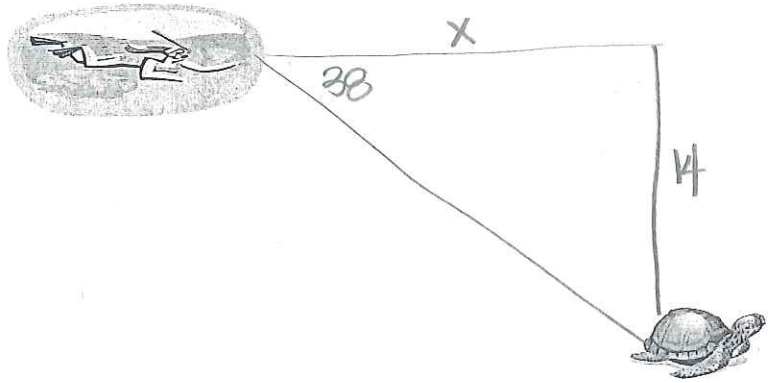
$\tan 52 = \frac{x}{9}$

$9\tan 52 = x$

$11.5 \approx x$

11.5m

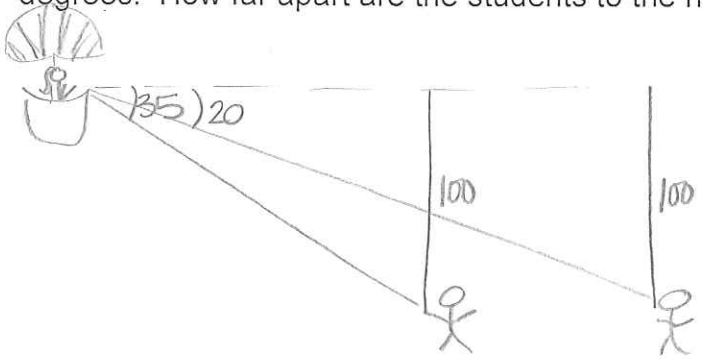
15. A person snorkeling sees a turtle on the ocean floor at an angle of depression of 38°. She is 14 feet above the ocean floor. How far from the turtle is she? Round to the nearest foot.



$\tan 38 = \frac{14}{x}$

17.9 ft = 18 ft

16. From her hot air balloon 100 feet up, Ms. Parnell spots two students on the ground. The angle of depression to student A is 35 degrees and the angle of depression to student B is 20 degrees. How far apart are the students to the nearest tenth?



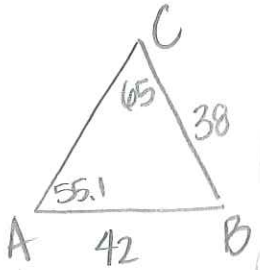
$\tan 35 = \frac{100}{x}$ $\tan 20 = \frac{100}{y}$

$142.8 \approx x$ $274.7 \approx y$

131.9 ft

Solve each triangle. Round all answers to the nearest tenth.

28. $m\angle C = 65$, $c = 42$ and $a = 38$.



$\frac{\sin 65}{42} = \frac{\sin A}{38}$

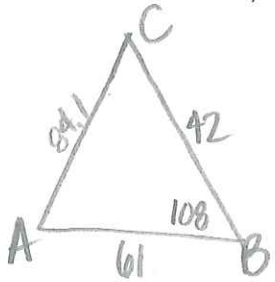
$m\angle A = 55.1°$

$m\angle B = 59.9°$

$\frac{\sin 65}{42} = \frac{\sin 59.9}{b}$

$b \approx 40.1$

29. $m\angle B = 108°$, $a = 42$ and $c = 61$.



$b^2 = 42^2 + 61^2 - 2(42)(61)\cos 108$

$b \approx 84.1$

$\frac{\sin 108}{84.1} = \frac{\sin C}{61}$

$m\angle A = 28.4°$

$43.6 \approx m\angle C$